

DR 12/27/04
2

Amendments to the Claims:

This listing of claims replaces all prior versions and listings of claims in the application:

Listing of Claims:

1. A flowmeter comprising:
a vibratable flowtube;
a driver connected to the flowtube and operable to impart motion to the flowtube;
a sensor connected to the flowtube and operable to sense the motion of the flowtube and generate a sensor signal; and
a controller connected to receive the sensor signal, the controller being operable to determine a first flow rate of a first phase within a two-phase flow through the flowtube and determine a second flow rate of a second phase within the two-phase flow.
2. The flowmeter of claim 1 wherein the first phase includes a gas and the second phase includes a liquid.
3. The flowmeter of claim 1 wherein the controller is operable to input an apparent density of the two-phase flow detected by the flowmeter and output a corrected density of the two-phase flow.
4. The flowmeter of claim 3 wherein the controller is operable to correct the apparent density based on a theoretical relationship between the apparent density and the corrected density.
5. The flowmeter of claim 3 wherein the controller is operable to correct the apparent density based on an empirical relationship between the apparent density and the corrected density.

revised

6. The flowmeter of claim 3 wherein the controller is operable to correct the apparent density based on a table storing relationships between the apparent density and the corrected density.

7. The flowmeter of claim 1 wherein the controller is operable to input an apparent mass flow rate of the two-phase flow detected by the flowmeter and output a corrected mass flow rate of the two-phase flow.

8. The flowmeter of claim 7 wherein the controller is operable to correct the apparent mass flow rate based on a theoretical relationship between the apparent mass flow rate and the corrected mass flow rate.

9. The flowmeter of claim 7 wherein the controller is operable to correct the apparent mass flow rate based on an empirical relationship between the apparent mass flow rate and the corrected mass flow rate.

10. The flowmeter of claim 1 wherein the controller is operable to input an apparent first phase fraction of the two-phase flow detected by the flowmeter that defines an amount of the first phase in the two-phase flow and output a corrected first phase fraction of the two-phase flow.

11. The flowmeter of claim 1 wherein the controller is operable to input a first phase fraction of the two-phase flow detected by a phase fraction sensor that is external to the flowmeter.

12. The flowmeter of claim 1 wherein the controller is operable to determine the first flow rate and the second flow rate based on corrected values for a detected density and detected mass flow rate of the two-phase flow.

13. The flowmeter of claim 12 wherein the controller is operable to determine the first flow rate and the second flow rate based on a corrected value for a detected first phase fraction that defines an amount of the first phase in the two-phase flow.

14. The flowmeter of claim 1 wherein the controller is operable to determine the first flow rate and the second flow rate based on densities of the first phase and the second phase, respectively.

15. The flowmeter of claim 1 wherein the controller is operable to determine a first superficial velocity of the first phase and a second superficial velocity of the second phase, based on the first flow rate and the second flow rate, respectively.

16. The flowmeter of claim 15 wherein the controller is operable to determine a flow regime of the two-phase flow, based on the first superficial velocity and the second superficial velocity.

17. The flowmeter of claim 16 wherein the controller is operable to determine a slip velocity between the first phase and the second phase, based on an average velocity of the first phase and an average velocity of the second phase.

18. The flowmeter of claim 17 wherein the controller is operable to provide corrections to the first flow rate and the second flow rate, based on the first and second superficial velocities, the determined flow regime, or the slip velocity, to thereby obtain a corrected first flow rate and a corrected second flow rate.

19-40. (Canceled)